

WHAT IS CLAIMED IS:

1. A ball screw comprising:

a number of balls;

a screw shaft having a helical thread groove formed
5 on an outer surface thereof;

a nut having a thread groove formed on an inner
surface thereof corresponding to the thread groove on said
screw shaft which engages with said screw shaft with the
interposition of the balls rollably provided in a helical
10 ball rolling path formed between said two thread grooves,

wherein a variation of the total of gaps between the
balls during the rolling of said balls is smaller than
1/20 of an outer diameter of the ball.

15 2. A ball screw comprising:

a number of balls;

a screw shaft having a helical thread groove formed
on an outer surface thereof;

a nut having a thread groove formed on an inner
20 surface thereof corresponding to the thread groove on said
screw shaft which engages with said screw shaft with the
interposition of the number of balls rollably provided
with a spacer for retaining a ball interposed therebetween
in a helical ball rolling path formed between said two
25 thread grooves,

wherein a variation of the total of gaps between said balls and said spacers during the rolling of said balls is smaller than $1/20$ of the diameter of said ball.

5 3. The ball screw according to Claim 1, wherein the variation of the total of gaps is adjusted by at least one of designed values of

a height of the ball circulating path from the center of the screw shaft,

10 a scooping angle of the ball, and

a radius of curvature of a bent portion of the ball circulating path.

15 4. The ball screw according to Claim 2, wherein the variation of the total of gaps is adjusted by at least one of designed values of

a height of the ball circulating path from the center of the screw shaft,

a scooping angle of the ball, and

20 a radius of curvature of a bent portion of the ball circulating path.

5. The ball screw according to Claim 1, wherein said nut is provided with a ball circulating path that has
25 an inner diameter slightly larger than the outer diameter

of the ball.

6. The ball screw according to Claim 2, wherein
said nut is provided with a ball circulating path that has
5 an inner diameter slightly larger than the outer diameter
of the ball.

7. The ball screw according to Claim 5, wherein
said ball circulating path comprises a return tube.

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8. The ball screw according to Claim 6, wherein
said ball circulating path comprises a return tube.